

# **PIN28** **SAVING COSTS FROM INFLUENZA IMMUNIZATION AMONG YOUNG CHILDREN – LIVE ATTENUATED VS. INACTIVATED INFLUENZA VACCINATION**

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**OBJECTIVES:** To evaluate the relative costs and benefits, from a payer perspective, between live attenuated influenza vaccine, trivalent (LAIV) and trivalent inactivated influenza vaccine (TIV) for eligible children 24–59 months of age. **METHODS:** We conducted a payer perspective, cost consequence analysis of LAIV compared to TIV, using patient-level data from a head-to-head randomized control trial (RCT) supplemented with cost data from published literature and health claims analysis. Model outcomes included total direct costs to payers and cases of influenza avoided for a single influenza season. Vaccine related costs included average payer reimbursement for vaccine, administration costs, and related adverse events. Cost related to breakthrough cases of influenza were also considered. Vaccine dosage and percentage of vaccine naïve children receiving two doses (69.4%) were assumed to mirror the RCT. All costs were reported in 2008 US dollars. Sensitivity analyses (SA) were run. **RESULTS:** Due in part to the higher estimated efficacy among young children (54% fewer influenza cases), LAIV had lower total direct costs per child (\$83.75) compared to TIV (\$92.00). Based on this model, use of LAIV is estimated to result in a cost savings of \$8.26 per vaccinated child (95% CI:\$3.09-\$13.39 savings). For every 100,000 children vaccinated, there were an estimated 5,572 fewer cases of influenza among children receiving LAIV. Despite LAIV's higher per dose cost (\$23.81 vs \$14.14 per dose), LAIV lowered overall health care utilization and resulted in a net cost savings. The SA found that difference in vaccine acquisition and administration prices, difference in vaccine efficacy, the proportion of children receiving two doses, and costs of hospitalization for influenza were influential parameters in the model. **CONCLUSIONS:** The payer specific analysis shows that compared to vaccinating with TIV, LAIV may lower costs and help reduce influenza cases in eligible children aged 24 to 59 months.

# **PIN29** **INFLUENZA: THE DEMOGRAPHICS AND TIME SPENT IN HOSPITALS OF THOSE INFECTED**

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**OBJECTIVES:** Yearly, people all around the country get flu shots to help prevent the flu virus, but still a large number of Americans are diagnosed with the flu each year. What we will examine in this study are the demographics of pediatric patients infected with this virus so that we can find some of the contributing factors requiring inpatient treatment for the flu. **METHODS:** We use data from the 2005 National Inpatient Sample provided by the Healthcare Cost & Utilization Project. We will look at age, race and gender as well as the amount of time pediatric patients spend in the hospital and the total charges incurred while hospitalized. Also, we will look at the diagnoses and procedures performed while in the hospital. We have 2578 patients with the flu and 2600 patients not diagnosed with the flu. Statistical methods were performed using the statistical software, SAS, including frequency counts, pie and bar graphs, kernel density and logistic and linear regressions. **RESULTS:** We will see that for the large percentage of people going into the hospital for the flu, most are only there for 3 days (85%); they are Caucasian (55%), incur \$16,500 (average) in charges while hospitalized, are between 0 and 3 years old (51%), male (55%), and have a low risk factor of death according to the Charlson index. The study will yield a better understanding of the demographics and length of stay of flu patients. **CONCLUSIONS:** What we also see is that patients with certain previous diagnosed diseases and procedures performed have a higher total cost and longer length of stay. The main diagnosis was lung disease and patients with this disease had significantly higher total charges as did patients with an endotracheal tube, spinal tap, or packed cells procedure performed.

# **PIN30** **ACUTE CARE COSTS OF GRAM-NEGATIVE PNEUMONIA IN THE UNITED STATES: A HEALTH CARE COST AND UTILIZATION PROJECT (HCUP) DATA ANALYSIS**

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**OBJECTIVES:** Gram-negative bacteria strains result in costly, and in some cases deadly, pneumonia related hospitalizations. Little information exists on acute hospital care and associated costs of gram negative pneumonia at a national level. Our objectives were to assess the prevalence of hospital stays for gram negative pneumonia, demographically and clinically characterize patients, assess hospital care patients received, identify associated costs, and quantify the clinical and economic burden of gram negative pneumonia in the United States. **METHODS:** Using the 2005 HCUP database, sponsored by the Agency for Healthcare Research and Quality, we assessed relevant patient principal and secondary diagnoses, primary and secondary procedures, demographics, and hospital charges, as well as payer composition. An event-based approach was used to assess resource use and costs associated with all gram negative bacteria. Charges were adjusted to 2008 US dollars. **RESULTS:** In 2005, 11,032 and 14,354 patients were admitted with principal and secondary diagnoses, respectively, of pneumonia due to gram-negative bacteria infection. Total annual per capita charges associated with these hospital stays were \$37,010 per admission as

principal diagnosis and \$132,066 per admission as secondary diagnosis. This resulted in \$328 million and \$1.17 billion nationally per principal and secondary diagnoses admissions respectively. For all patients, the inpatient mortality rate was 13%, with nearly 60% of patients requiring additional care after their discharge. The most common procedures for all patients included ventilation (32%) and tracheotomies (11%). Pseudomonas was the most frequent and the most expensive gram negative strain, accounting for 53% of the total hospital stays for principal diagnosis patients and 43% for secondary diagnosis patients. **CONCLUSIONS:** These results present the substantial hospital-specific burden of pneumonia due to gram-negative bacteria, and highlight the need to explore opportunities to decrease the infection rate and/or reduce their potency once infection occurs.

# **PIN31** **THE ECONOMICS AND EPIDEMIOLOGY OF MENINGOCOCCAL INFECTION: A SYSTEMATIC LITERATURE REVIEW**

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**OBJECTIVES:** To conduct a systematic literature review of studies in peer-reviewed journals on the epidemiology and economics of invasive meningococcal disease from 1997–2007. **METHODS:** This review employed standard methodology to extract studies from the Scopus on-line database of peer-reviewed, medical and public health literature from the preceding 10 years. U.S. and international populations, policies, practices, study design, and methods were evaluated. **RESULTS:** There has been a steady incidence of meningococcal disease in the U.S. since 1989 ranging from 0.3–1.0/100,000 persons per year. Individuals under 1 year of age or between 15 and 24 are generally at a higher risk of infection. High density living arrangements are a major risk factor for meningococcal infection. Worldwide, there is significant variation in the incidence and management of meningococcal disease. The highest incidence of meningitis is found in the “Meningitis Belt” of Africa with serotype A responsible for 66% of disease. In Europe, the incidence of meningitis varies widely from country to country ranging from 2.5/100,000 in Switzerland to 10.2/100,000 in Greece. In general, countries react to outbreaks of meningococcal infection with targeted vaccination programs. There is a high price associated with the use of conjugate vaccines. In a probabilistic model of disease burden an adolescent catch-up vaccination program in the U.S. would cost society \$127,000 per life year saved and \$223,000 per case averted. Outside the U.S. the cost per life year saved varied substantially by country and by study due to varying costs and modeling techniques. **CONCLUSIONS:** Many nations in the developing world do not implement prevention strategies until an epidemic of meningococcal infection has inflicted a substantial burden of disease, triggering aid organizations to support a catch-up vaccination campaign in response to an outbreak. Variations in health resources between countries significantly affect cost comparisons between countries.

# **PIN32** **PHARMACOECONOMIC RELEVANCE OF ANTI-RETRO VIRAL THERAPY (ART) IN LOW AND MIDDLE INCOME COUNTRIES**

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**OBJECTIVES:** The objective of the study was to explore variation in costs of ARTs between low- and middle-income countries, lines of therapy, and drug regimens over time. **METHODS:** A search of database of WHO, Global Price Reporting Mechanism (GPRM), Pubmed and relevant grey literature from 2004–2008 was undertaken. Two reviewers selected all descriptive or interventional studies involving cost associated with ART therapy in low- or middle-income countries (as defined by World Bank criteria) and compared it. **RESULTS:** Approximately 3,000,000 people are currently receiving ART in low- and middle-income countries. However, global coverage of ART is still limited, reaching 31% of the 9.7 million people in need at the end of 2007. In 2007, the weighted median price of the four most widely used combinations in first-line treatment was US\$188/person/year. The median price paid for first-line treatment in low-income countries in 2007 ranged from US\$92/person/year for the fixed dose combination (FDC) of stavudine + lamivudine + nevirapine to US\$294 for the FDC of zidovudine + lamivudine + efavirenz, whereas this price ranged from US\$91 to US\$357 for respective FDC's for middle-income countries. The median cost of a regimen of didanosine + abacavir + ritonavir-boosted lopinavir, the most commonly used second-line regimen was US\$ 1214 in low-income countries and US\$ 3306 in middle income countries. In low and middle-income countries, the prices of most first-line treatments decreased by 30–64% from 2004 to 2007 whereas, the average prices paid for second-line regimens remained high. **CONCLUSIONS:** Cost associated with ART is comparatively lower in low-income countries as compared to middle-income countries for first-line as well as second-line treatment regimens. Costs of most first-line treatments have decreased over time but coverage of ART still remains low in these countries.